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Docket No.: SON-1508 (80001-1508)

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Hiroki ENDO et al.

Confirmation No.: 5505

Application No.: 09/272,331

Art Unit: 2612

Filed: March 19, 1999

Examiner: Rashawn N. Tillery

For: SON-1508 METHOD OF PRODUCING
COLOR FILTER FOR SOLID-STATE
IMAGING DEVICE

APPELLANT'S BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

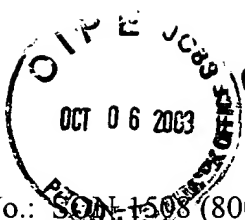
This brief is in furtherance of the Notice of Appeal, filed in this case on August 5, 2003.

10/26/03
96
The fees required under § 1.17(f) and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate.

This brief contains items under the following headings as required by 37 C.F.R. § 1.192 and M.P.E.P. § 1206:

- I. Real Party In Interest
- II Related Appeals and Interferences
- III. Status of Claims
- IV. Status of Amendments
- V. Summary of Invention



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- VI. Issues
- VII. Grouping of Claims
- VIII. Arguments
- IX. Claims Involved in the Appeal
- Appendix A Claims

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Sony Corporation

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 17 claims pending in application. Claims 1-17 stand finally rejected, and no claims are currently allowed. Accordingly, the Appellants hereby appeal the final rejection of claims 1-17, which are presented in the Appendix

B. Current Status of Claims

1. Claims canceled: None
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 1-17
4. Claims allowed: None
5. Claims rejected: 1-17

B. Claims On Appeal

The claims on appeal are claims 1-17

IV. STATUS OF AMENDMENTS

Applicant filed an Amendment After Final Rejection on May 5, 2003. The Examiner responded to the Amendment After Final Rejection in an Advisory Action mailed September 10, 2003 Paper No. 13). In the Advisory Action, the Examiner indicated that Applicants' amendments would be entered.

Accordingly, the claims enclosed herein as Appendix A incorporate the amendments to claims 1, 3, 6, 8 and 12 as indicated in the Amendment filed August 6, 2003.

V. SUMMARY OF INVENTION

Claim 1 recites a method of producing a color filter, comprising the steps of: forming a filter layer of a second color 7 in a substrate region in which a filter element of a first color 11 is to be formed; and overlapping a filter layer of a third color 8 different from said second color 7 on said filter layer of said second color 7 and on said substrate; wherein two overlapping filter layers form the filter element 11, and wherein said filter layer of a third color 8 is made from a dye containing photoresist.

Claim 6 recites a color filter comprising: a filter element of a first color 11, said first color filter element having a filter layer of a second color 8 overlapping a portion of a filter layer of a third color 7, wherein said first, second and third colors 8, 9, 7 are different from each other, and wherein the second color layer 8 is both in the same row as the third color layer 7 and the second color layer 8 is in a row above the third color layer 7, and wherein said filter layer of a third color is made from a dye containing photoresist.

Claim 12 recites a solid-state imaging device comprising: a plurality of light receiving sensor portions 2 for photo-electric conversion, provided in a surface layer portion of a substrate 1; and a color filter provided correspondingly to said plurality of light receiving sensor portions; wherein said color filter has a filter element of a first color 10 having a filter layer of a second

color 9 overlapping a portion of a filter layer of a third color 7, and wherein said filter layer of a third color 7 is made from a dye containing photoresist.

The second color layer, for example 8 in Figs. 1B-1C, is formed in a region in which a filter layer of a first color, for example 7, is to be formed. This forms a first row on the substrate 1. The filter layer of the second color 8 overlaps a portion of the filter layer of the first color 7, the overlapping portion forming a first filter element 11. Stacking a filter layer of a third color, for example 9, different from said first and second color on each of said non-overlapping portion on each of said filter layer of said first and second color; wherein two stacked filter layers form a filter element, and at least one filter element forms the color filter. Accordingly, as depicted in Fig. 1C, three different filter elements 10, 11 and 12 can be formed. See also page 6, lines 6-23, page 8, line 7 to page 11, line 23.

VI. ISSUES

The issues presented for consideration in this appeal is as follows:

- (1) Whether the Examiner erred in rejecting Claims 1-2, 4, 6-7 and 9-16 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,876,167 to Snow et al.?
- (2) Whether the Examiner erred in rejecting Claims 3, 8 and 17 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,140,396 to Needham et al.?
- (3) Whether the Examiner erred in rejecting Claim 5 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,805,966 to Yamada in further view of EP 726503A2 to Ugai et al.?

VII. GROUPING OF CLAIMS

For purposes of this appeal brief only, and without conceding the teachings of any prior art reference, the claims have been grouped as indicated below:

Group Claim(s)

I. Claims 1-2 and 4 stand or fall together with respect to the §102(b) rejection as being anticipated by U.S. Patent No. 4,876,167 to Snow et al.

II. Claims 6, 7 and 9-11 stand or fall together with respect to the §102(b) rejection as being anticipated by U.S. Patent No. 4,876,167 to Snow et al.

III. Claims 12-16 stand or fall together with respect to the §102(b) rejection as being anticipated by U.S. Patent No. 4,876,167 to Snow et al.

IV. Claims 3, 8 and 17 stand or fall separately with respect to the §103(a) rejection as being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,140,396 to Needham et al.

V. Claim 5 stands or falls alone with respect to the §103(a) rejection as being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,805,966 to Yamada in further view of EP 726503A2 to Ugai et al.

In Section VIII below, Applicant has included arguments supporting the separate patentability of each claim group as required by M.P.E.P. § 1206.

VIII. ARGUMENTS

In the Final Office Action of May 5, 2003 (Paper No. 10), the following rejections were presented by the Examiner:

(i) 35 U.S.C. §102

The Examiner rejected claims 1-2, 4, 6-7 and 9-16 under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 4,876,167 to Snow et al.

(ii) 35 U.S.C. §103

The Examiner rejected claims 3, 8 and 17 under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,140,396 to Needham et al.

The Examiner rejected claim 5 under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,805,966 to Yamada in further view of EP 726503A2 to Ugai et al.

(iii) Other

None

For at least the following reasons, Appellant submits that these rejections are both technically and legally unsound and should therefore be reversed.

(i) 35 U.S.C. §102

Claims 1-2, 4, 6-7 and 9-16 were rejected under 35 U.S.C. §103(a) as being anticipated by U.S. Patent No. 4,876,167 to Snow et al. Appellants respectfully traverse this rejection.

Claim 1 recites a method of producing a color filter, comprising the steps of: forming a filter layer of a second color in a substrate region in which a filter element of a first color is to be formed; and overlapping a filter layer of a third color different from said second color on said filter layer of said second color and on said substrate; wherein two overlapping filter layers form the filter element, and wherein said filter layer of a third color is made from a dye containing photoresist.

Claim 6 recites a color filter comprising: a filter element of a first color, said first color filter element having a filter layer of a second color overlapping a portion of a filter layer of a third color, wherein said first, second and third colors are different from each other, and wherein

the second color layer is both in the same row as the third color layer and the second color layer is in a row above the third color layer, and wherein said filter layer of a third color is made from a dye containing photoresist.

Claim 12 recites a solid-state imaging device comprising: a plurality of light receiving sensor portions for photo-electric conversion, provided in a surface layer portion of a substrate; and a color filter provided correspondingly to said plurality of light receiving sensor portions; wherein said color filter has a filter element of a first color having a filter layer of a second color overlapping a portion of a filter layer of a third color, and wherein said filter layer of a third color is made from a dye containing photoresist.

Snow et al. '167 discloses a color filter array containing interlaid sets of laterally displaced filters. Referring to Figs. 1 and 2, a single row of two colors 3 is placed on a substrate 1. A second row of colors is then placed on top of the first row. There is no example given such that the same color layer appears in both the first row and the second row.

Still further, Snow et al. '167 has the problem in that imbibing dye after overlapping a layer containing no dye on the other layer positioned below, causes the diffusion of the dye from the overlapping layer to the overlapped layer, and controlling the diffusion length of the dye is difficult.

In contrast, the claims recite that the second color layer, for example 8 in Figs. 1B-1C, is formed in a region in which a filter layer of a first color, for example 7, is to be formed. This forms a first row on the substrate. The filter layer of the second color 8 overlaps a portion of the filter layer of the first color 7, the overlapping portion forming a first filter element 11. Stacking a filter layer of a third color, for example 9, different from said first and second color on each of said non-overlapping portion on each of said filter layer of said first and second color; wherein two stacked filter layers form a filter element, and at least one filter element forms the color filter. Accordingly, as depicted in Fig. 1C, three different filter elements 10, 11 and 12 can be formed.

Clearly Snow et al. '167 does not disclose, teach or suggest that a color layer can appear in both the first row and the second row.

Still further, as acknowledged by the Office Action at page 5, Snow et al. '167 does not disclose, teach or suggest filter layers made from a dye containing photoresist.

A document can only anticipate a claim if the document discloses, explicitly or implicitly, each and every feature recited in the claim. Verdegall Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Since Snow et al. '167 fail to disclose, either explicitly or implicitly, at least the above-noted feature recited in independent claims 1, 6 and 12, Snow et al. '167 cannot anticipate the claim. At least in view of the foregoing, claims 1, 6 and 12 are allowable, and the rejection should not be sustained.

Dependent claims 2 and 4, depending from claim 1, claims 7 and 9-11 depending from claim 6, and claims 13-16 depending from claim 12, are also allowable as depending from allowable base claims, as well as for the additional features they recite. Accordingly the §102 rejection with respect to Snow et al. '167 should not be sustained.

(ii) 35 U.S.C. §103

Claims 3, 8 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,140,396 to Needham et al. Applicants respectfully traverse this rejection.

Dependent claim 3 depending from claim 1, claim 8 depending from claim 6, and claim 17 depending from claim 12, are also allowable for the reasons above. Moreover, these claims are further distinguished by the materials recited therein, particularly within the claimed combination. Accordingly the rejection of these claims should not be sustained.

Still further, as discussed above, Snow et al. '167 does not disclose, teach or suggest filter layers made from a dye containing photoresist. Snow et al. '167 has the problem in that imbibing dye after overlapping a layer containing no dye on the other layer positioned below, causes the diffusion of the dye from the overlapping layer to the overlapped layer, and controlling the diffusion length of the dye is difficult.

Needham et al. '396 discloses forming a filter layer on a substrate utilizing a photoresist material. More specifically, Needham et al. '396 discloses and teaches the formation of a single filter layer having a dye. Needham et al. '396 does not disclose, teach or suggest and overlapping filter layer. Accordingly, it would not be obvious to overlap a filter layer made from a dye containing a photoresist on the filter layer, and Needham et al. '396 does not make up for the deficiencies of Snow et al. '167. Still further, even if Needham et al. '396 was applied to

Snow et al. '167, the process of Needham et al. '396 would need to be repeated with a different dye to each entire filter layer. See Abstract. Since Needham et al. '396 does not disclose, teach or suggest overlapping layers and only discloses single filter layer having a dye, Needham et al. '396 does not make up for the deficiencies of Snow et al. '167.

Accordingly, a prima facie case of obviousness does not exist, and the rejection should not be sustained.

Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,805,966 to Yamada in further view of EP 726503A2 to Ugai et al. Applicants respectfully traverse this rejection.

Dependent claim 5 depending from claim 1, is also allowable for the reasons above. Moreover, this claim is further distinguished by the materials recited therein, particularly within the claimed combination. Accordingly the rejection of the claim should not be sustained.

(iii) Other

None

Conclusion

In view of the foregoing reasons, Appellant submits that the final rejection of claims 1-17 is improper and should not be sustained. Therefore, a reversal of the Final Rejection of May 5, 2003, as to claims 1-17, is respectfully requested.

IX. CLAIMS INVOLVED IN THE APPEAL

A copy of the claims involved in the present appeal is attached hereto as Appendix A. As indicated above, the claims in Appendix A do include the amendments filed by Applicant on August 6, 2003.

Dated: October 6, 2003

Respectfully submitted,

By 

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 09/272,331

1. (previously presented) A method of producing a color filter, comprising the steps of:

forming a filter layer of a second color in a substrate region in which a filter element of a first color is to be formed; and

overlapping a filter layer of a third color different from said second color on said filter layer of said second color and on said substrate;

wherein two overlapping filter layers form the filter element, and

wherein said filter layer of a third color is made from a dye containing photoresist.

2. (Original) A method of producing a color filter according to claim 1, wherein said first color is a primary color, and each of said second and third colors is a complementary color.

3. (previously presented) A method of producing a color filter according to claim 1, wherein each of said filter layers of said second color is made from a dye containing positive photoresist.

4. (Original) A method of producing a color filter according to claim 1, wherein said color filter is composed of filter elements of a plurality of said first colors each of which is either of red, green and blue colors; and

wherein said filter elements of said plurality of said first colors are produced by the steps of:

forming a yellow filter layer as a filter layer of said second or third color in a region in which said filter elements of red and green colors as said first colors are to be formed;

forming a cyan filter layer as a filter layer of said second or third color in a region in which said filter elements of green and blue colors as said first colors are to be formed; and
forming a magenta filter layer as a filter layer of said second or third colors in a region in which filter elements of red and blue colors as said first colors are to be formed.

5. (Original) A method of producing a color filter according to claim 4, wherein a principal pigment contained in a material for forming said yellow filter layer is an azo pigment; a principal pigment contained in a material for forming said cyan filter layer is a copper phthalocyanine pigment; and
a principal pigment contained in a material for forming said magenta filter layer is a xanthene pigment.

6. (previously presented) A color filter comprising:
a filter element of a first color, said first color filter element having a filter layer of a second color overlapping a portion of a filter layer of a third color,
wherein said first, second and third colors are different from each other, .
wherein the second color layer is both in the same row as the third color layer and the second color layer is in a row above the third color layer, and
wherein said filter layer of a third color is made from a dye containing photoresist.

7. (Original) A color filter according to claim 6, wherein said first color is a primary color, and each of said second and third colors is a complementary color.

8. (previously presented) A color filter according to claim 6, wherein each of said filter layers of said second color is made from a dye containing photoresist.

9. (Original) A color filter according to claim 6, wherein said first color is red, and said second and third colors are yellow and magenta respectively.

10. (Original) A color filter according to claim 6, wherein said first color is green, and said second and third colors are yellow and cyan respectively.

11. (Original) A color filter according to claim 6, wherein said first color is blue, and said second and third colors are cyan and magenta respectively.

12. (previously presented) A solid-state imaging device comprising:
a plurality of light receiving sensor portions for photo-electric conversion, provided in a surface layer portion of a substrate; and
a color filter provided correspondingly to said plurality of light receiving sensor portions;
wherein said color filter has a filter element of a first color having a filter layer of a second color overlapping a portion of a filter layer of a third color, and
wherein said filter layer of a third color is made from a dye containing photoresist.

13. (Original) A solid-state imaging device according to claim 12, wherein said first color is a primary color, and each of said second and third colors is a complementary color.

14. (Original) A solid-state imaging device according to claim 12, wherein said first color is red, and said second and third colors are yellow and magenta respectively.

15. (Original) A solid-state imaging device according to claim 12, wherein said first color is green, and said second and third colors are yellow and cyan respectively.

16. (Original) A solid-state imaging device according to claim 12, wherein said first color is blue, and said second and third colors are cyan and magenta respectively.

17. (previously presented) A solid-state imaging device according to claim 12, wherein each of said filter layers of said second color is made from a dye containing photoresist.